AMENDMENT

To the Drawings:

Figures 1-3 have been amended to be designated by "Prior Art".

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REMARKS

This is a full and timely response to the outstanding non-final Office Action mailed June 28, 2006. Applicants submit that claims 1 and 4 have been amended for improving clarity without entering any new matter, while the other claims remain unchanged from their original forms. The title of the invention and the drawings have been amended according to the Examiner's suggestions. Reconsideration and allowance of the application and presently pending claims 1-6 are respectfully requested.

Claim Rejections-35 U.S.C. §112

Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph.

The Examiner believes that the relationships (a) and (b) recited by claim 1 are unclear. In response thereto, Applicants have amended claim 1 as: "**arrangement order of the parity block is: if** $D_{X,Y} = P_{X,Y}$, **then** $D_{X-1,Y+1} = P_{X-1,Y+1}$ **where X-1 is an integer in the range of 1~M, and Y+1 is an integer in the range of 1~N**" and "**if** $D_{X,Y} = P_{X,Y}$, **then** $D_{X-1,Y+1} = P_{X-1,Y+1}$ **when X-1 is an integer in the range of 0~M, and Y+1 is an integer in the range of 1~N**"(Emphasis added). As emphasized, the data block $D_{0,1}$ does not exist in the relationship (a) and the data block $D_{-1,2}$ does not exist in the relationship (b) as currently amended. As such, Applicants submit that claim 1 is now patentable over 35 U.S.C. 112, second paragraph.

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Claim Rejections-35 U.S.C. §102

Claims 1-6 are rejected under 35 U.S.C. 102 (b) as being anticipated by Anderson

(US Patent No. 6,442,649).

In response to the rejection thereto, Applicants have amended claims 1 and 4 as:

"disposing the expansive storage device in front of the 1st storage device" (Emphasis added).

Anderson teaches the expansive storage device D04 is added in back of the storage device

D03 for expansion process. The storage device D02 is an original-existing storage device

(shown in the FIGs.1-3, 6-8 and lines 45-53 in column 3), rather than an expansive storage

device (D4 or D5, line 40 in column 5) in the cited reference, on which the Examiner relies

to read on the expansive storage device as set forth in claim 1. It should be noted that the

present application is claimed as a method of expanding RAID, not a storage device

compared with Anderson's device. Applicant submits that the method of claims 1 and 4 can

not be read as Anderson's device.

Anderson teaches the parity blocks remain at their original locations on the original

storage device in FIGs.3 and 6-8, however, the parity blocks are not rearranged in each of all

the storage devices. Some disadvantages of Anderson's method as follows:

(1) The Write (samll block update) performance of RAID5 will be impacted after

expansion with Anderson Method

The parity block will not be spread to the new added Hard Disk. So the Hard

Disks with parity data block will be limited to the original group of disks. The write

operation of RAID 5 will need to update data and parity at the same time. In the FIG.6

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of Anderson's paper (US6442649, Sheet 5 of 7), the parity blocks spread over 4 HDs (D0~D3), but the data blocks spread over 6 HDs (D0~D5). It will cause un-balance loading to for accesses to data block and parity block, because there are 6 HDs could serve the data block access, but only 4 HD could serve parity block access. So the parity block access will be the bottleneck for RAID5 write operation.

The present application could make the parity blocks spread over all HDs, so it does not have this kind of disadvantage like as Anderson's method.

(2) The Read/Write (big chunk data) performance of RAID5 will be impacted after expansion with Anderson Method.

For the RAID application with big chunk data access, it is important to have multiple disks to serve the requesr of big chunk data. With concurrent data transferation of mutiple disks, the request with big chunk data could be complete in a much shorter time. In the FIG.6 of Anderson's paper (US6442649, Sheet 5 of 7), the data blocks 12~15 are located at single HD (D4). It would have much poor performance than the present application, because data blocks 12~15 will be spread over all HDs as to the present application.

(3) Anderson's method needs a new mapping function to handle the area of new added HD.

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It will increase the complexity of RAID handling. But the present application does not have this disadvantage, because the data layout is the same as that in normal RAID5. The RAID5 handling method could be keep consistency after RAID5 expansion.

For at least the foregoing reasons, the present method as set forth in claims 1-6 should be allowed over the cited references.

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CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims 1-6 are in proper condition for allowance and an action to such effect is earnestly solicited. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

Date : Sept. 23, 2006
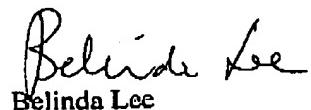
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